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ABSTRACT

This study examined how student teachers thought about their teaching, exploring their professional evolution as they progressed from academic study within the university to formal employment as teachers. It highlighted a 10-week secondary school placement in their final university semester. Each student teacher was observed teaching and interviewed immediately afterwards. Interviews examined what they had been thinking about and what had been occurring in the classroom. Results indicated a lack of explicit attention to formal student achievement in terms of targets, standards of attainment, and performance indicators. Maintenance of specific patterns of students' classroom activity that student teachers regarded as normal and desirable was considered important. The greatest proportion of statements emphasized factors influencing the circumstances under which teaching occurred. Respondents considered five broad conditions to have important contextual influences on their teaching: student characteristics; impact of teachers' and other adults' presence; time; content; and resources. Classroom conditions exerted a powerful influence on student teachers' actions. Though student teachers were not asked to evaluate their own performance, most did so. There was a marked contrast between how student teachers thought about their teaching as they taught and the ubiquitous models of teaching as a technical delivery/decision-making activity. (SM)

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How Student Teachers Think About their Classroom Teaching

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How Student Teachers Think About their Classroom Teaching

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Exploring Student Teachers' Professional Craft Knowledge

This research forms part of a sequence of studies on how teachers and student teachers think about their work while they are in the classroom. It emerges from an interest in the conditions under which they are prepared to reflect on, consider innovation in, and actually change their practice. The work was carried out in an education system (Scotland) where there has been increasing "advice" from central government. This advice has focused on *what* should be learned by pupils and the "competences" teachers and student teachers should display from pre-school to tertiary education. Substantial criticism has been made by researchers of what is seen as a profoundly mechanistic and unrealistic approach that construes teachers as delivery agents of "targets" for pupils that are largely set by others. Government has countered by saying that its concern is to promote "evidence-based teaching" and that research has failed to provide such evidence. The research stands accused of lacking a cumulative character and celebrating irrelevant or second-rate novelty rather than replication or practical application.

One of the problems with this stance is that when sound, accumulated and relevant evidence *is* provided, those who read it do not necessarily find it to their liking, especially if it implies a need for a change in their own thinking. To give the government its due several studies in the sequence, of which this is one, have been government funded; but that is different from saying that any notice has been taken of the findings. The findings of this study are by no means surprising, should offer evidence that is useful to teacher educators and add to an area that has generated extensive and interested academic discussion. With their teacher educator hats on, however, such academics often resist or at least disregard such findings. Such disregard is, of course, happening within a policy atmosphere where the idea of taking teacher education out of the hands of the universities and locating it within schools is by no means beyond the Pale. Resistance to research findings does not endanger employment; neglect of government advice may carry that risk.

The government's approach provides a de-contextualised view of teaching (although teachers are, of course, told to take account of the circumstances in which they find themselves). This is religiously followed by a hefty proportion of Scottish teacher educators who continue to subscribe to the traditional rational planning model of

- identification of objectives (behavioural or otherwise and now referred to as "performance indicators", "targets" and "standards")
- design of activities to achieve those objectives
- implementation of actions to foster those activities
- evaluation of the achievement of the objectives.

The findings from research (or, indeed, common sense) suggest we should have little confidence that this reflects the ways teachers, in reality, think about their teaching while they are actually engaged in it. However, teachers are, of course, very practised and effective in engaging in debate about teaching models of this kind. That debate is not of concern here, since our focus is on individuals' thinking as they are teaching. Nor is this paper designed to address other relevant academic debates about situated learning or authentic activities, but it does arise from an assumption that it is important to understand how student-teachers make sense of what they do while they are actually in the complexity of the classroom.

It is assumed that individual student teachers develop distinctive expertise that reflects the knowledge embedded in their practice. As this knowledge grows, it increasingly provides them with the means of analysing the specific situations in which they find themselves in their everyday teaching, and of drawing on their growing repertoires of classroom actions that they feel comfortable in taking. If the aim is to improve their teaching and persuade them to reflect on what they do, then the more that is known about how they make sense of the world of classroom work the greater the chance of helping them to achieve these things. In any kind of development, whether the implementation of policy innovations or learning to be an experienced teacher, it is necessary to start from *where people are*, rather than from where we would like them to be.

As well as endeavouring to understand student teachers' classroom thinking, a second objective of the research was the accumulation of more evidence about the patterns of, and concepts most salient to, teachers' classroom thinking in different contexts. As a result of this, we were able to consider the ways in which beginning teachers' thinking relates to how experienced teachers make sense of what they do. To offer some brief comparisons, we have looked at findings from three of the other studies: Brown and McIntyre (1993), Cooper and McIntyre (1996) and Swann and Brown (1997). In doing this, use has been made of a conceptual framework from the 1993 study that has been sustained through the subsequent work (Figure 1). These studies (together with three others) used data from different samples making the accumulation of evidence for the framework more significant. However, they were not designed to facilitate strict comparisons with the student teacher findings reported here and so any comparative inferences drawn must be cautious.

This research has been construed as an exploration of the *professional craft knowledge* (PCK) that student teachers have acquired by the time they reach this final stage of their initial teacher education. By PCK we refer to knowledge that is firmly rooted in teachers' *practical experience* (Cooper and McIntyre, 1996, pp75-76). It arises from and, in turn, informs what teachers actually do. Because this aspect of teachers' knowledge depends explicitly on practical teaching experience, student-teachers' professional craft knowledge would be expected to be more tentative, less confident and with fewer detailed commentaries on, for example, individual pupils in their classes. However, positioned as they were, at the end of their initial teacher education, they might also be expected to be more influenced than teachers in schools by the most recent documentation on the technological approach of the national

curriculum developments, and to display more awareness of its characteristic concepts such as "targets" for pupils' achievements.

Research Approach

This research explored one aspect of 38 student-teachers' professional evolution as they progressed from the part of their programme that predominantly comprised academic study within the University (three or four years on this concurrent course) to their formal employment as teachers. It focused on a long (10 weeks) full-time secondary school placement (17 secondary schools) in their final University semester, one aim of which was to socialise them into the practices of teaching as (almost) regular members of the teaching staff. . Each student was engaged in teaching one of eight subjects with classes aged between 12 and 16 years, but mostly between 12 and 14.

Each student teacher was observed teaching single or double period lessons and interviewed *immediately* following the lesson. It was this interview which provided the data for the analysis reported in this paper. Very open questions were used to invite the student teachers to talk about what they had been thinking about and what had been going on in the classroom. The questions were phrased in the past tense in order to focus on the work of the observed lesson rather than eliciting more generalised information, and considerable efforts were made to avoid any substantive issues or ideas being contributed by the researcher to the discussion. An emphasis was laid on motivating the students to give their accounts by focusing on that they saw as having gone well and what they had done to encourage things to go the way they wanted them to.

The analysis of the data was an iterative, inductive process using transcribed data (see Brown and McIntyre, 1993, pp52-53 for a description of this procedure). In reporting it here, use is made of the conceptual framework developed and validated in the 1993 Brown and McIntyre study, which has been explored further in each of the other studies, and has remained a useful basis on which to analyse teachers' classroom thinking. The framework (Figure 1) had four interrelated concepts: the *normal desirable states of pupil activity* that teachers endeavoured to establish and maintain, the various kinds of *progress* they wished to promote, the *actions* they took to foster these activities or progress and the *conditions* they saw as impinging on their teaching. The first three of these concepts are features of many prescriptive and de-contextualised models for teaching, but the fourth was distinctive in the way it influenced teachers' choice of action and the standards of activity or progress that could be expected in a given classroom context. . Essentially all of the student-teachers' accounts (1906 coded statements) could be accommodated within that framework except for those parts of the text relating to student teachers' explicit evaluations of their own performance (106 statements).

Findings: Pupil Progress

A striking feature of the student teachers' statements about their classroom work was the lack of explicit attention paid to formal pupil achievements in terms of targets,

standards of attainment and performance indicators. Despite the stress on these concepts in official documentation and emphatic discussion of such goals within the University-based part of the initial teacher education programme, *none* of these terms was mentioned and there was only one reference to fulfilling objectives. Less than 7 percent of all coded statements related to pupils' achievements, progress or development, and these were primarily focused on short-term concerns about specific task completion and grasp of particular cognitive understandings. This finding was not dissimilar to the 1993 study (Brown and McIntyre). However, the 1996 study (Cooper and McIntyre), with a prescriptive influence of a National Curriculum on experienced teachers' practice, suggested teachers' growing concern for longer-term aims for pupil outcomes, and in 1997 Swann and Brown noted that increasing external assessment requirements tended to increase teachers' emphasis on pupil progress. Furthermore, in comparison with the student teachers, the experienced teachers had suggested much more balance between cognitive and affective goals and concerns that there were circumstances in which one kind had to be prioritised over the other.

Findings: Pupil Activities

As in the studies of experienced teachers, the maintenance of specific patterns of pupils' classroom activity that the student teachers regarded as *normal and desirable* was important. References to these activities were more than twice as frequent as those concerned with pupil progress. Most emphasis was placed on pupils appropriately interacting with the teacher and getting on with the task in hand. Some student teachers framed their statements in terms of pupils undertaking the processes (mental or expressive) required for learning, and maintaining the conditions for learning through appropriately constructive behaviour. It seemed they focused heavily on task related cognitive activity and placed less emphasis than the experienced teachers did on affective activity patterns of pupils enjoying or displaying interest in the work. Most statements commented on the class as a whole rather than on individual pupils.

About half of respondents, however, suggested that they had not always been able to achieve what they would regard as normal and desirable patterns of activity. Classes proved less responsive or ready to participate without disruption than they would have wished. They were aware that they had to teach in a dynamic environment where the best laid plans and goals for the standards of classroom activity or pupils' progress could be undermined by the impact on their teaching of the circumstances in which they were working. There was a consciousness that it was not enough to select a set of goals and recipes for activities to achieve those goals. Successful teaching involves responding flexibly and fluently to pupils and other features of the conditions associated with the complexity of the classroom environment. The next section relates to the student teachers' commentaries in those conditions as they impinged on their teaching.

Findings: Conditions Impinging on the Classroom Teaching

By far the greatest proportion of statements (nearly 1000) in the student teachers' commentaries was focused on the factors that influenced the circumstances under

which the teaching took place. This emphasis was also evident, though less acutely, in the commentaries from experienced teachers in the other studies. These factors or conditions were recognised as having a profound effect on the standards they could expect to achieve and on the actions they might choose to take to achieve anything at all. "Official" rational plans for teaching tend to mention only briefly the need for teachers to adapt them to the particular pupils and general environment in which they find themselves. However, that adaptation, rather than the rational plans, was for these student teachers the main thrust of their thinking. There were five broad conditions that they regarded as having important contextual influences on their teaching: pupils' characteristics, features of teachers themselves or other adults, time, content and resources.

Pupil Conditions

Conditions relating to pupils' characteristics or behaviour were most frequently mentioned (552), as they had been in the studies of experienced teachers. They included a fairly equal balance between those characteristics seen as enduring and those as just significant on the day. In the studies of the experienced teachers' craft knowledge, there was more emphasis on enduring pupil characteristics, and on pro-active approaches that could take account of these. Student teachers, of course, could not be expected to have the same extent of knowledge of the pupils and so were not in a position to act in this pro-active way. Inevitably they had to adopt more reactive stances.

Some conditions were seen as having a positive impact on the teaching and others as negative. So, for example, activities might progress faster on the day because the pupils were better behaved than expected, or slower because they lacked some piece of knowledge that the student teacher had expected them to have.

The most important conditions identified by the student teachers, under both the "enduring" and "on the day" headings, were pupils' (i) reluctance or willingness to work and (ii) behaviour. The "enduring" category implied a perception of a balance among pupils of those seen as keen to work and those not ready, for whatever reason, to put in the effort. Most of these statements referred to the class as a whole with less discussion of individual pupils. The behaviour sub-categories were mostly (85 and 68 per cent of statements) concerned with the negative impact of disruptive activities or of talking and shouting. On the positive side, co-operation was much more likely (in contrast with talking and shouting rather less likely) to be recognised as characteristics of pupils "on the day" than as "enduring".

Almost as important were the abilities, capabilities and knowledge that pupils brought to the classroom. It was the notion of some kind of intrinsic and enduring "general ability", invoked by almost all the student teachers, that stood out as the most salient constraining or supporting condition. This finding has clear links with those for the experienced teachers, and emphasises the tendency of the beginning teacher to invoke a simple idea like general ability in order to cope with the complexity of the class. There was rather little evidence of detailed appreciation of individual pupils' learning difficulties, concentration levels or need for support.

Impact of Teachers' and Other Adults' Presence

A second aspect of the conditions impinging on the teaching concerned factors relating to the student teacher or other adults present (or with their presence felt) in the classroom. This was referred to about half as frequently (239 statements) as pupil conditions, but assumed considerably more importance for student teachers than it had done in the studies of experienced teachers.

Among these statements, 60 per cent related to conditions imposed by the student teachers themselves. The majority of these focused on what the student teachers saw as negative influences on their classroom work and had no referents in the experienced teachers' accounts. They reflected anxieties and feelings of inadequacy arising from not being the regular experienced class teacher and having problems with predicting what could be expected of pupils, the timing of the work, maintaining continuity, class control and achieving rapport with the class. Where these problems had been to some extent resolved, conditions were expected to foster a calmer, more thoughtful impact on teaching. However, those positive comments, that indicated a relaxed student teacher and a more established rapport with pupils or work without disruption, were less than one quarter as frequent as the negative.

Although student teachers work with considerable autonomy, much of the time they are "borrowing" the class and so have a sense of being transient and standing in for other teachers. They were concerned about being able to "give back" the pupils to their class teacher in "good order" and would have liked more freedom to position pupils, choose content, activities or materials and have more sense of class ownership.

The schools or class teachers largely prescribed the student teachers' classroom work (topics, worksheets, patterns of progression and tasks to be undertaken) and provided either a supportive framework for teaching or constraints that had to be endured. The student teachers saw some aspects of the schools' *organisational* features, such as the provision of learning support or of materials and the sequencing of work, as offering significant assistance to classroom activities. Various school rules, conventions and sanctions associated with *discipline*, and help given on class control, also tended to be cited with relief as offering behaviour frameworks within which they were thankful to be working. However, they expressed concerns about class teachers' behaviour impinging on their teaching, especially if it implicitly questioned whether the student teacher was in charge of the class. Only a small minority mentioned learning support teachers or assistants; they were regarded as fulfilling the traditional remedial role of taking care of pupils with the most significant difficulties, allowing the student teacher to get on with the rest of the class. Co-operative teaching was mentioned only once.

Time Conditions

The student teachers were conscious of the impact of time in two respects: the availability of time and its management, and the time of the day/week/ term when the teaching was taking place. Experienced teachers in the earlier studies referred to, but were less concerned about, their ability to manage time.

Most commented on constraints from shortage of time (with a few mentioning excess of time) in relation to three inter-related elements. First, there were inadequacies in allocations of time on the timetable and some aspects of the subjects could not be pursued. Secondly, within class-time the student teachers were pushed to get through the main content and so other important matters were neglected. Thirdly, getting pupils settled and introducing topics took more time than expected. Good time management and planning were valued.

There were two concerns about *when* the class teaching occurred. One focused on the relationship between pupils' behaviour and the day: willing and subdued on Mondays, good on Wednesdays, calm and hard working on Thursdays, unsettled and boisterous on Fridays ("a bad day"). The second pointed to what had preceded the lesson and from where the pupils had come. For example, it was suggested that physical education made pupils unsettled and late in arriving, personal and social development affected what they were prepared to engage with, break caused them to be lively and after lunch they needed to be settled down. Similar comments had been made, but less frequently, by some experienced teachers in the earlier studies.

Content Conditions

There was a significant number of statements (rather more than from experienced teachers) on the impact of various characteristics of the content on the teaching. *Difficulty* of the content was described in two ways. The first focused on intrinsic factors: too abstract, inappropriately advanced or obscure and strange for the pupils. The second emphasised the paucity of the pupils' skills, knowledge or independent thinking for dealing with the demands made by the content. The *support and sequencing* of content was largely identified as having a positive influence in helping the development of pupils' understanding, the reinforcement of earlier work and the continuity necessary for cumulative learning. Content *relevance and interest* was seen by some as an important condition in helping to motivate the class.

Resource Conditions

Although the public discourse of concern about teaching has focused heavily on the shortage of resources, statements about this were sparse among the student-teachers, as they were among the more experienced teachers. Among these, concerns were expressed about the non-availability of writing materials, unsatisfactory computer networks, lack of stimulating texts, faulty equipment or demonstration models, document errors and barriers to visual contact in the classroom.

Findings: Student Teachers' Actions

The conditions they encountered in the classrooms exerted a powerful influence on the actions taken by the student teachers. Their statements about their actions also reflected their concern to maintain patterns of what they saw as normal desirable pupil activity and, to a lesser extent, to promote progress. There was less emphasis on the fostering of progress than was apparent in the work with experienced teachers, especially those in the later studies. Broadly speaking, the actions fell into two categories: *teaching* (nearly 75 percent) and *controlling* (just over 25 percent).

Actions to teach the class

On average, just over 10 statements per student teacher were concerned with teaching actions. Among a number of sub-categories, a criterion of an average of 1.5 statements per respondent was the measure of significance. Only three of the sub-categories achieved this level across the 38 students: general interaction and monitoring; describing, explaining or demonstrating; and affective indicators and responses.

A large number of statements referred to the student teacher moving around the class and/or interacting with groups and individuals. Two thirds of these included references to monitoring how the work was proceeding. Mostly, this was expressed as a general monitoring of the whole class rather than of specific pupils. Phrases used included listening in to group discussions, keeping a watch on the class, getting round everyone, sitting and talking to them, glimpsing everyone's work, checking answers and seeing where hands were up.

Secondly, processes of explanation, clarification or "going over" aspects of the work were stressed. Actions were taken both pro-actively and reactively (in response to questions or misunderstandings). Explanations focused on new substantive matters, procedural issues (how to do it), justifications of particular approaches or content, expected outcomes of the work, feedback on pupils' efforts and reinforcement, remedial or revision information. Demonstrations made use of videos and practical exemplification.

Thirdly, there was emphasis on provision of reassurance, demonstration of trust, comments to build up confidence, being seen to listen to or seek out pupils' views, giving them autonomy, responding sensitively to individual preferences or problems and acting in ways that were seen to be fair. These statements predominantly focused on the whole class rather than individuals, efforts to coax or fire the imagination and motivation of pupils by praising, urging, reinforcing or rewarding.

In addition there were statements about provision of information or instructions, questioning and providing help for individual pupils. The sub-category of *responding to the unexpected*, with very few statements, did not stand up as a distinct dimension of the student teachers' discourse on their classroom actions. It is mentioned only because the experienced professionals in the earlier studies appeared to have the capacity to change the direction of their teaching in response to unanticipated events or unexpected responses from pupils. This capability is, not surprisingly, less evident in the beginning teacher.

Actions to control the class

The intentions behind the actions to exert classroom control included making clear who was in charge, ensuring that the pupils settled and engaged with the work, drawing attention to (and keeping on top of) disruptive and noisy behaviour, imbuing some sense of manners towards others and deterring pupils from distracting others. A few comments indicated that individual student teachers tried very tough approaches (for example, to maintain silence) and found them unhelpful. Others indicated that the importance of avoiding the alienation of pupils had led to actions deliberately designed not to raise the temperature. Four student teachers offered no responses identified as actions to exert classroom control.

The most salient sub-category suggested student-teachers told, threatened, shouted and generally drew attention to undesirable features of behaviour, noise, idleness, manners and disregard of rules on the part of the class as a whole. Control of particular individuals or small groups of pupils was reflected in significantly fewer statements where pupils were asked, told, suggested and warned about minor misdemeanours, disruptions and failures to engage with the work of the class.

Using rather different tactics to avoid confrontation, some statements were concerned with fending off the escalation of problems. So, for example, the student teachers made efforts not to shout, diverted pupils' attention to more interesting matters, responded to apologies and ignored some attention seeking behaviours. They also used non-verbal control measures, often in conjunction with verbal measures. These included becoming silent until order was restored, moving pupils within or out of the classroom, reorganising group membership, changing the topic or focus of the lesson, assigning punishment exercises, writing behaviour reports and, in one case, establishing a written agreement with a pupil.

Findings: Student Teachers' Self-Evaluations

The student teachers were not asked to evaluate their own performance, but just over three-quarters of them did so. Having been in initial teacher education for three or four years, they had become accustomed to reflecting on and evaluating their own performance as they learned to be a teacher. The statements focused on classroom events in general or on specific aspects, but in only a minority was there evidence of the student teacher using the evaluative judgement as a learning exercise. Such evaluations did not feature in the studies of experienced teachers.

Of those statements evaluating lessons *generally*, very few judged them as unexciting, disjointed or not having worked well. Much more prolific were indications that things had gone well, classroom experiences were successful and the student teachers had been pleased or encouraged. However, more than half of the statements on *specific* lesson elements were less positive. The evaluations focused positively on lesson content, processes (e.g. discussion), levels of interest or enjoyment, practical successes (e.g. experiments), progress through or engagement in the work, maintenance of discipline and rapport, timing and structure of the experiences. A few referred to pupils having learned as intended, but none commented on achievement of targets or offered evidence of systematic assessment of learning. Negative evaluations commented on such things as poor quality of the lesson introduction, failure to assess the prior knowledge or capabilities of pupils and shortcomings of the management of the class including discipline and timing of the work.

Discussion

The most marked finding of this research is the contrast between the ways it suggests student teachers think about their teaching as they teach and the ubiquitous models of teaching as a technical delivery/decision-making activity. Despite their exposure to presentations of teaching as a rational matter of deciding on objectives or targets,

designing pupils' activities and teachers' actions to achieve those targets and evaluating what has been achieved, their ways of construing what they did looked very different. The two main elements of the student teachers' thinking focused on the *maintenance of particular patterns of classroom activity* which they saw as desirable, and on the various *conditions which impinged on their teaching*. The most important of these conditions related to the characteristics and behaviours of the pupils. There was also intense concern, however, with the impact on their teaching from their own feelings of insecurity in "survival" circumstances. Scant attention was paid to targets or formal objectives for learning. Pupils' progress was referred to in less than ten per cent of statements and was construed primarily as short-term completion of specific tasks and the grasp of particular understandings.

One of the features both of the technical-rational model that has underpinned so much of the prescription for teaching, and of the competence model for teacher education, has been their de-contextualised nature and their endeavour to present themselves in ways that are generalisable across classrooms and across teachers. Much of the "academic" parts of teacher education programmes are similarly de-contextualised. What was striking about the student teachers' thinking was how contingent it was on the conditions within which the teaching was taking place. Context was all-important. The complexity of contexts is such that initiatives which tell teachers to implement targets or other features of the rational model do not have a simple task on their hands. No wonder the government is less than enthusiastic about such evidence.

It is the issues for teacher educators, however, that are the main concern of this paper. In comparing the findings of this research with those of earlier studies of experienced teachers' thinking, there were strong similarities in the general emphasis on patterns of classroom activity, major preoccupation with the conditions impinging on the teaching and the absence of references to technical-rational approaches. There was evidence, however, that student teachers had less knowledge about the impact of some of the more enduring characteristics of pupils, and under some circumstances the experienced practitioners came to place more explicit stress on long-term goals for student learning. The most obvious distinctions between the students and experienced teachers were the anxieties and feelings of inadequacy the students expressed and which they saw as influencing their teaching. Such feelings arose, on the one hand, from their sense of inexperience or inability to make professional judgements and, on the other hand, from the impact on their work of the behaviour or attitudes of the regular class teachers and schools. Not surprisingly, for many of the student teachers there was a focus on "survival" and self-evaluation in their accounts that was not at all apparent in the more relaxed commentaries from experienced teachers.

The somewhat rough and ready comparisons made between the findings about these student teachers' professional craft knowledge and those relating to experienced teachers, as revealed by earlier studies, offer some promise of establishing insights into how that knowledge develops as experience grows. They also provide opportunities to relate how, on the one hand, the student teachers and, on the other hand, the supervising teachers in the schools, make sense of classroom practice. That relationship is important because supervising teachers have a significant role to play in the preparation of the students. However, that is only one aspect of the educational experience that the students have. Teacher educators would argue that within the

higher education institutions there are those parts of the provision for teacher education where students must be offered wider perspectives on issues with overarching relevance through, for example, research findings, policy analysis or theoretical considerations. Such offerings, it is suggested, are unlikely to be provided by the schools.

There is a variety of purposes such input might be expected to fulfil. My own institution might emphasise the importance of aims such as the development of an understanding of the covert effects of taken-for-granted aspects of teacher behaviour, a questioning of assertions about what constitutes "good practice" and a growing awareness of alternative and competing ways of construing classroom teaching. It could be argued that this kind of knowledge is acquired from theoretical sources and is not to be confused with the professional craft knowledge that is drawn from practical experience. However, the description of professional craft knowledge derived from Cooper and McIntyre (1996) in the early part of this paper should also have suggested that PCK can be, and often is, informed by those theoretical sources. Teacher educators with responsibility for designing and refining teacher education programmes have a non-trivial interest in this important matter for two reasons. The first of these relates to the political accountability of Scottish universities in the preparation of teachers. If we cannot demonstrate some positive benefit to be gained from student teachers engagement with the academic aspects of the programmes provided within higher education institutions, then the justification for the involvement of those institutions loses public credibility. The second reason is more fundamental to the way we think about initial teacher education. Our assumption is that we have an impact on student teachers' thinking and practice (in both the short and long term) and we design our contributions to their programme the best way we know how. However, we are remarkably ignorant about the processes through which such influence operates, of the nature and extent of the influence we actually exert, and of how we might do it better in order to achieve our aims.

Since these students were close to the end of a three and a half, or four and a half, year concurrent course, a salient question might be "To what extent does their professional craft knowledge appear to have been informed by the academic provision within the university's education programme?" At one level the answer to that question appears to be "Not much". A quick look at the analysis of the data does not immediately provide evidence that the student teachers were integrating into the accounts of their teaching any ideas culled from the academic education part of their programme in the University. There was an apparent dearth of references to matters such as the implications of labelling pupils, inclusion, situated learning, the power and limitations of constructivist theories, gender issues, the value and weaknesses of competence models of teaching, the confluence of cognitive and affective goals and so on. There are obvious dangers, however, in drawing conclusions from data analysis that was designed for a different purpose and has not been replicated.

Because there are at least two important reasons why we should be looking for evidence of the impact made on student teachers' professional craft knowledge by the theoretical elements of the academic input to the programme, we have to clarify a number of things. First, we have to be sure we have conceptualised, as far as possible, the nature of the influences we would hope to have on student teachers' thinking

about their work. This would include consideration of whether those influences would be likely to be manifest in contexts and at times when the student teachers were engaged in planning their work, actually teaching, reflecting on or evaluating what had been done, writing about teaching or some other relevant activity. It would also be necessary to give thought to the stage in the individual's career (as student, beginning or experienced teacher) at which evidence of impact is expected to emerge. The "survival" priority in early classroom experiences may imply that we have to look at later career stages for the evidence we are seeking: practical wisdom takes time to develop. Secondly, it would be important to identify the kind of evidence, direct or indirect, that would be sought, in the various contexts of thinking about teaching, as indicators of such influences. Thirdly, in any study of this kind a "vigilance" element would be required to endeavour to pick up evidence of a kind the researchers had not thought of in advance. Our research team has not yet undertaken an analysis of this kind, but sees it as promising an important element for the debate about the role of higher education in teacher education.

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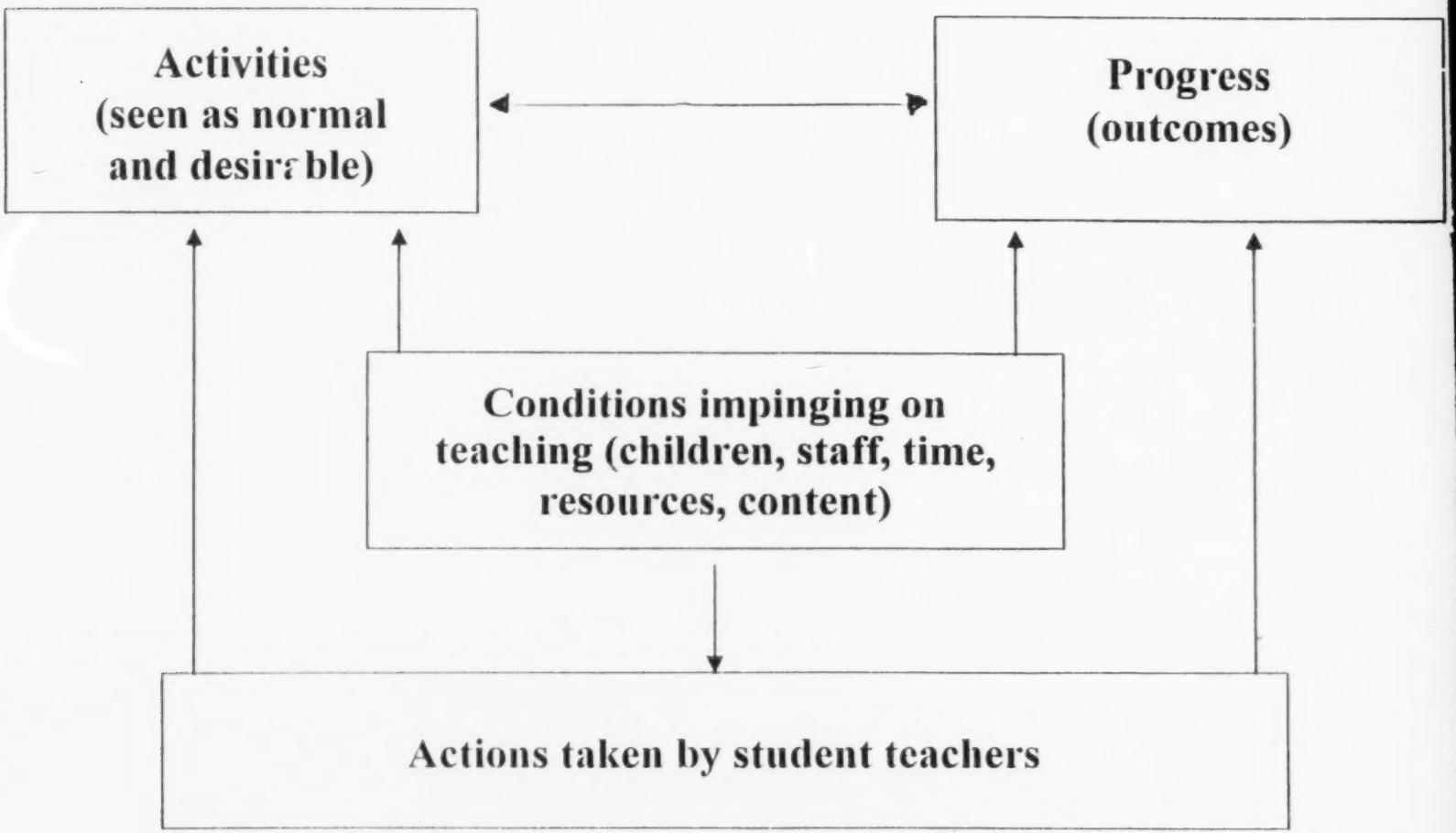
FIGURE 1


Activities
(seen as normal
and desirable)
Progress
(outcomes)
Conditions impinging on
teaching (children, staff, time,
resources, content)
Actions taken by student teachers